

IN THE CLAIMS

Pursuant to 37 CFR §121(c), the claim listing, including the text of the claims, will serve to replace all prior versions of the claims, in the application.

Please amend claims 1, 18 and 20 as follows:

- 1 1. (Currently Amended) A method for managing forwarding information in a
2 router having a distributed architecture including a plurality of routing nodes, the method
3 comprising the steps of:
 - 4 i) forming an aggregation tree corresponding to each routing node, the aggregation
5 tree including actual nodes corresponding to forwarding information of each routing node
6 and virtual nodes for aggregating forwarding information of each routing node;
 - 7 ii) varying the aggregation tree when forwarding information is added to each
8 routing node;
 - 9 iii) checking a creation area of the forwarding information added to each routing
10 node in step ii);
 - 11 iv) determining whether to advertise the forwarding information to other routing
12 nodes by analyzing the aggregation tree and making a determination to advertise the
13 forwarding information to the other routing nodes when the forwarding information was
14 created in a local area of a predetermined routing node;
 - 15 v) advertising the forwarding information to the other routing nodes and storing
16 the forwarding information in a local forwarding table of the predetermined routing node
17 when the determination is made in step iv) to advertise the forwarding information to
18 other routing nodes;
 - 19 vi) determining whether to store the forwarding information in the local
20 forwarding table of the predetermined routing node by analyzing the aggregation tree and
21 making a determination to store the forwarding information in the forwarding table of the

22 predetermined routing node when the forwarding information was not created in a local
23 area of the predetermined routing node; and

24 vii) storing forwarding information in the local forwarding table of the
25 predetermined routing node based on the determination in step vi).

1 2. (Original) The method as claimed in claim 1, wherein, in step i), a prefix,
2 which is address information for receiving forwarding information corresponding to each
3 node of the aggregation tree, length information about the prefix, a type of forwarding
4 information, information of a source IOP creating forwarding information, an IOP flag
5 for notifying whether or not forwarding information is advertised to other routing nodes,
6 and an FT flag for notifying whether or not forwarding information is stored in the local
7 forwarding table are stored as a property of the node of the aggregation tree.

1 3. (Original) The method as claimed in claim 2, wherein step i) includes the
2 substeps of checking a creation area of forwarding information, determining the type of
3 forwarding information depending on a sort of processors creating forwarding
4 information when forwarding information is created from the local area, and storing
5 virtual type forwarding information as the type of forwarding information if forwarding
6 information is created from a virtual area.

1 4. (Original) The method as claimed in claim 3, wherein step i) includes the
2 substeps of determining that forwarding information is transferred from the virtual area if
3 the prefix of the forwarding information is a private IP (Internet protocol) address by
4 analyzing the prefix, and determining that forwarding information is created from the
5 local area if the prefix of the forwarding information is not the private IP address.

1 5. (Original) The method as claimed in claim 1, wherein step ii) includes the
2 substeps of adding a node corresponding to added forwarding information to the
3 aggregation tree, and storing a property of the node added to the aggregation tree based
4 on a prefix and creation area information of added forwarding information.

1 6. (Original) The method as claimed in claim 5, wherein, in step ii), the prefix,
2 which is address information for receiving forwarding information corresponding to each
3 node of the aggregation tree, length information about the prefix, a type of forwarding
4 information, information of a source IOP creating forwarding information, an IOP flag
5 for notifying whether or not forwarding information is advertised to other routing nodes,
6 and an FT flag for notifying whether or not forwarding information is stored in the local
7 forwarding table are stored as the property of the node of the aggregation tree.

1 7. (Original) The method as claimed in claim 6, wherein step ii) includes the
2 substeps of checking a creation area of forwarding information, determining the type of
3 forwarding information depending on a sort of processors creating forwarding
4 information when forwarding information is created from the local area, and storing
5 virtual type forwarding information as the type of forwarding information if forwarding
6 information is created from a virtual area.

1 8. (Original) The method as claimed in claim 7, wherein step ii) includes the
2 substeps of determining that forwarding information is transferred from the virtual area if
3 the prefix of the forwarding information is a private IP (Internet protocol) address by
4 analyzing the prefix, and determining that forwarding information is created from the
5 local area if the prefix of the forwarding information is not the private IP address.

1 9. (Original) The method as claimed in claim 7, wherein step iii) includes the
2 substeps of extracting the type of forwarding information corresponding to the node
3 added to the aggregation tree in step ii) by analyzing the property of the node, and
4 checking the creation area of forwarding information corresponding to the node based on
5 the type of forwarding information.

1 10. (Original) The method as claimed in claim 2, further comprising a step of
2 varying a first flag (IOP flag) and a second flag (FT flag) of the node according to a result
3 achieved through performing at least one of steps v) to vii).

1 11. (Original) The method as claimed in claim 1, wherein step iv) includes the
2 substeps of:

- 3 a) checking whether or not a parent node of the node added to the aggregation tree
4 in step ii) exists in the aggregation tree; and
- 5 b) checking whether or not the node added to the aggregation tree in step ii) and
6 the parent node thereof are created from a same routing node if the parent node exists in
7 the aggregation tree.

1 12. (Original) The method as claimed in claim 11, wherein, in step v), forwarding
2 information corresponding to the node added to the aggregation tree in step ii) is stored in
3 the local forwarding table of the corresponding routing node without advertising
4 forwarding information corresponding to the node added to the aggregation tree in step ii)
5 to other routing nodes if the node and the parent node thereof are created from the same
6 routing node.

1 13. (Original) The method as claimed in claim 11, wherein, in step v), forwarding
2 information corresponding to the node added to the aggregation tree in step ii) is stored in

1 the local forwarding table of the corresponding routing node after advertising forwarding
2 information corresponding to the node added to the aggregation tree in step ii) to other
3 routing nodes if the node and the parent node thereof are created from different routing
4 nodes.

1 14. (Previously Presented) The method as claimed in claim 11, wherein, in step
2 v), if the aggregation tree has no parent node of the node added to the aggregation tree in
3 step ii), the parent node of the node is created, and forwarding information corresponding
4 to the node added to the aggregation tree in step ii) is stored in the local forwarding table
5 of the corresponding routing node after advertising forwarding information to other
6 routing nodes.

1 15. (Original) The method as claimed in claim 14, wherein, in step v), a node
2 having a prefix, which is determined by excepting a lowermost 1 bit value from the prefix
3 of the node added to the aggregation tree in step ii), is created as the parent node of the
4 node added to the aggregation tree in step ii).

1 16. (Original) The method as claimed in claim 1, wherein step vi) includes the
2 substeps of:

3 a) checking whether or not a parent node of the node added to the aggregation tree
4 in step ii) exists in the aggregation tree; and

5 b) checking whether or not the node added to the aggregation tree in step ii) and
6 the parent node thereof are created from a same routing node if the parent node exists in
7 the aggregation tree.

1 17. (Original) The method as claimed in claim 16, wherein, in step vii),
2 forwarding information corresponding to the node added to the aggregation tree in step ii)
3 is stored in the local forwarding table of the corresponding routing node if the node and
4 the parent node thereof are created from different routing nodes.

1 18. (Currently Amended) The method as claimed in claim 16, wherein, in step
2 vii), if the aggregation tree has no parent node of the node added to the aggregation tree
3 in step ii), the parent [[nod]] node of the node is created and stored in the local
4 forwarding table of the corresponding routing node.

1 19. (Original) The method as claimed in claim 18, wherein, in step vii), a node
2 having a prefix, which is determined by excepting a lowermost 1 bit value from the prefix
3 of the node added to the aggregation tree in step ii), is created as the parent node of the
4 node added to the aggregation tree in step ii).

1 20. (Currently Amended) A method for managing forwarding information in a
2 router having a distributed architecture including a plurality of routing nodes, the method
3 comprising the steps of:

4 i) forming an aggregation tree corresponding to each routing node, the aggregation
5 tree including actual nodes corresponding to forwarding information of each routing node
6 and virtual nodes for aggregating forwarding information of each routing node;

7 ii) analyzing the aggregation tree of each routing node in response to a deletion of
8 forwarding information in each routing node and checking a creation area of deleted
9 forwarding information;

10 iii) advertising the deletion of forwarding information to other routing nodes only
11 when the forwarding information deleted is determined to have been advertised to other

12 routing nodes after analyzing the aggregation tree to establish that the forwarding
13 information deleted was created in a local area of the corresponding routing node,
14 deleting the node corresponding to the forwarding information deleted from the
15 aggregation tree, and deleting forwarding information from a local forwarding table of
16 the corresponding routing node; and

17 iv) deleting the node corresponding to the forwarding information from the
18 aggregation tree when the forwarding information deleted was not created from the local
19 area of the corresponding routing node.

1 21. (Original) The method as claimed in claim 20, wherein, in step i), a prefix,
2 which is address information for receiving forwarding information corresponding to each
3 node of the aggregation tree, length information about the prefix, a type of forwarding
4 information, information of a source IOP creating forwarding information, an IOP flag
5 for notifying whether or not forwarding information is advertised to other routing nodes,
6 and an FT flag for notifying whether or not forwarding information is stored in the local
7 forwarding table are stored as a property of the node of the aggregation tree.

1 22. (Original) The method as claimed in claim 21, wherein step i) includes the
2 substeps of checking a creation area of forwarding information, determining the type of
3 forwarding information depending on a sort of processors creating forwarding
4 information when forwarding information is created from the local area, and storing
5 virtual type forwarding information as the type of forwarding information if forwarding
6 information is created from a virtual area.

1 23. (Original) The method as claimed in claim 22, wherein step i) includes the
2 substeps of determining that forwarding information is transferred from the virtual area if
3 the prefix of the forwarding information is a private IP (Internet protocol) address by

1 analyzing the prefix, and determining that forwarding information is created from the
2 local area if the prefix of the forwarding information is not the private IP address.

1 24. (Original) The method as claimed in claim 22, wherein step ii) includes the
2 substeps of extracting the property of the node corresponding to deleted forwarding
3 information from the aggregation tree, extracting the type of deleted forwarding
4 information based on the property of the node, and checking the creation area of deleted
5 forwarding information based on the type of deleted forwarding information.

1 25. (Original) The method as claimed in claim 20, wherein, in step iii), deletion
2 information of forwarding information is not advertised to other routing nodes if deleted
3 forwarding information is not advertised to other routing nodes, and forwarding
4 information is deleted from the local forwarding table of the corresponding node after
5 deleting the node corresponding to deleted forwarding information from the aggregation
6 tree.

1 26. (Original) The method as claimed in claim 20, wherein step iii) includes the
2 substeps of:

3 a) checking whether or not a sibling node of the node corresponding to deleted
4 forwarding information exists in the aggregation tree by analyzing the aggregation tree;
5 and

6 b) advertising information of the sibling node to other routing nodes if the sibling
7 node of the node corresponding to deleted forwarding information exists in the
8 aggregation tree.

1 27. (Original) The method as claimed in claim 26, wherein step iii) further
2 comprises a step of deleting a parent node of the node corresponding to deleted
3 forwarding information from the aggregation tree when the aggregation tree has no
4 sibling node of the node corresponding to deleted forwarding information.

1 28. (Original) The method as claimed in claim 20, wherein step iv) includes the
2 substeps of:

3 a) adding a sibling node of the node corresponding to deleted forwarding node to
4 the aggregation tree when information of the sibling node is transferred from a routing
5 node creating deleted forwarding information; and
6 b) storing sibling node information in the local forwarding table of the
7 corresponding routing node by analyzing the aggregation tree.

1 29. (Original) The method as claimed in claim 20, wherein substep b) includes
2 the steps of:

3 c) checking whether or not a parent node of the sibling node added to the
4 aggregation tree in substep a) exists in the aggregation tree;
5 d) checking whether or not the sibling node added to the aggregation tree in
6 substep a) and the parent node thereof are created from a same routing node when the
7 parent node exists in the aggregation tree; and
8 e) storing forwarding information corresponding to the sibling node added to the
9 aggregation tree in substep a) in the local forwarding table of the corresponding routing
10 node if the sibling node added to the aggregation tree in substep a) and the parent node
11 thereof are created from different routing nodes.

1 30. (Original) The method as claimed in claim 20, wherein, in substep b), if the
2 aggregation tree has no parent node of the sibling node added to the aggregation tree in

1 substep a), the parent node of the sibling node is created and stored in the local
2 forwarding table of the corresponding routing node.

1 31. (Original) The method as claimed in claim 30, wherein a node having a
2 prefix, which is determined by excepting a lowermost 1 bit value from the prefix of the
3 node added to the aggregation tree in step a), is created as the parent node of the sibling
4 node added to the aggregation tree in step a).

1 32. (Original) A method for managing the forwarding information, comprising
2 the steps of:

3 forming in a router constructed with a distributed architecture including a
4 plurality of routing nodes, an aggregation tree corresponding to each routing node, with
5 the aggregation tree including actual nodes corresponding to forwarding information for
6 each of the routing nodes and virtual nodes for aggregating forwarding information of
7 each of the routing nodes;

8 varying the aggregation tree when forwarding information is added to each
9 of the routing nodes;

10 identifying a creation area of forwarding information added to each of the
11 routing nodes;

12 analyzing the aggregation tree, advertising to other routing nodes the
13 forwarding information added, and storing forwarding information in a local forwarding
14 table of a corresponding routing node when the forwarding information added is created
15 from a local area of the corresponding routing node; and

16 storing forwarding information in the local forwarding table of the
17 corresponding routing node based when the forwarding information added is not created
18 from the local area of the corresponding routing node.

1 33. (Original) A method for managing the forwarding information, comprising
2 the steps of:

3 forming in a router constructed with a distributed architecture including a
4 plurality of routing nodes, an aggregation tree corresponding to each routing node, with
5 the aggregation tree including actual nodes corresponding to forwarding information for
6 each of the routing nodes and virtual nodes for aggregating forwarding information of
7 each of the routing nodes;

8 analyzing the aggregation tree of each of the routing nodes in response to a
9 deletion of forwarding information in each routing node;

10 determining a creation area of the forwarding information deleted from an
11 aggregation tree;

12 advertising to other routing nodes, the deletion of the forwarding
13 information deleted only when the forwarding information deleted had been advertised to
14 other routing nodes by:

15 analyzing the aggregation tree for the routing node corresponding to
16 the forwarding information deleted when the forwarding information deleted had
17 been created from a local area of the corresponding routing node,

18 deleting one of an actual node and a virtual node corresponding to
19 the forwarding information deleted from the aggregation tree, and

20 deleting the forwarding information deleted from a local forwarding
21 table of the corresponding routing node; and

22 deleting one of an actual node and a virtual node corresponding to the
23 forwarding information deleted from the aggregation tree when the forwarding
24 information deleted was not created from the local area of the corresponding routing
25 node.